

Zero Retries issue 0057 2022-07-29

Zero Retries is a unique, quirky little highly independent, opinionated, self-published email newsletter about technological innovation in Amateur Radio, for a self-selecting niche audience, that's free (as in beer) to subscribe.

About Zero Retries

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Request To Send

Countdown to [Digital Communications Conference 2022](#) - September 16-18, in Charlotte, North Carolina, USA:

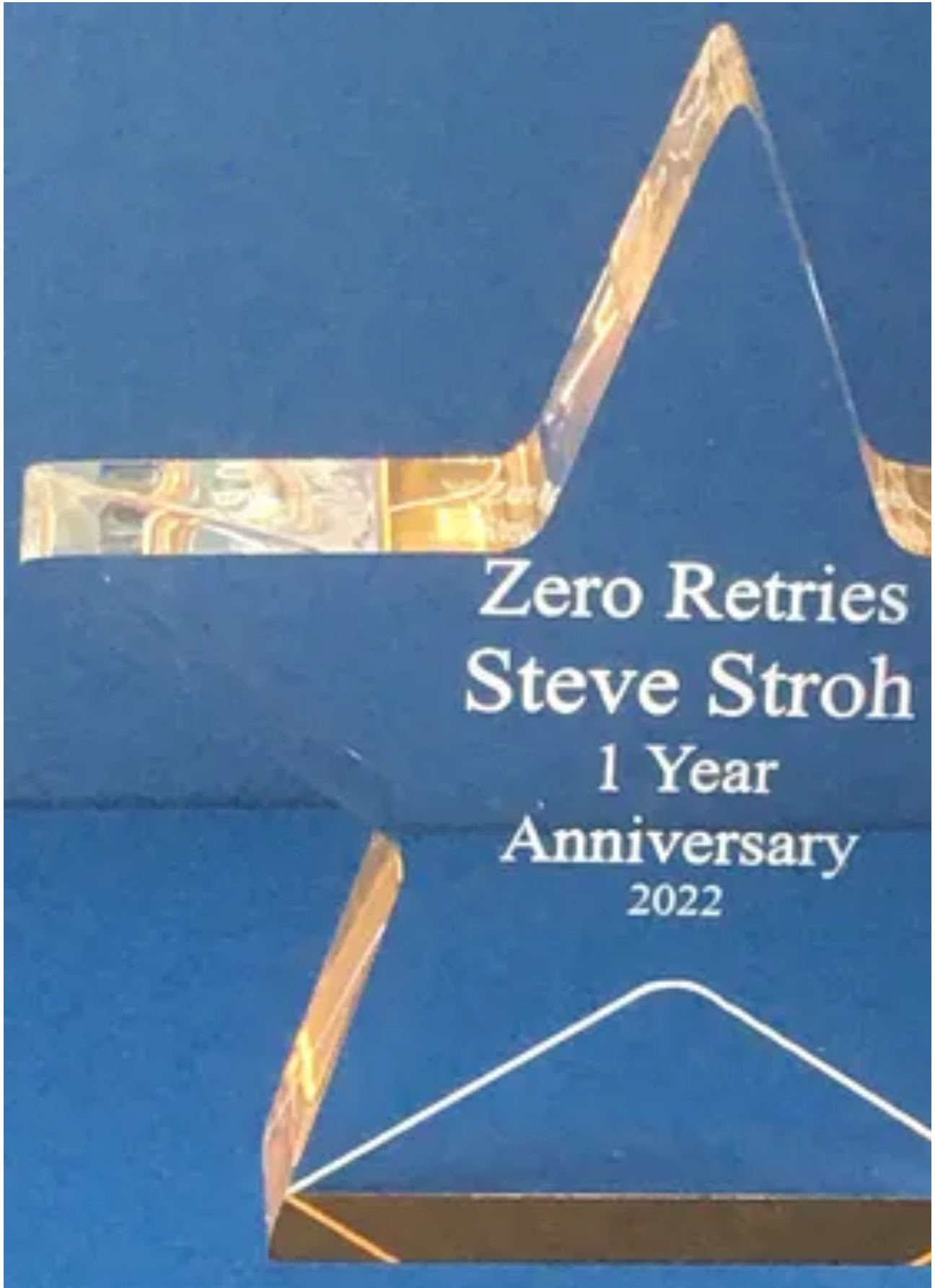
~~10~~ ~~09~~ ~~08~~ 07 weeks...

Countdown to DCC 2022 Paper submission deadline - September 1:

~~~08~~ ~~~07~~ ~~~06~~ ~~~05~~ weeks...

Saturday evening 2022-07-16 was supposed to be pleasant, but uneventful evening with Tina and I going out to dinner with some Amateur Radio friends that we've known for decades.

Early in the evening, very casually and subtly, my friend Michael Sterba KG7HQ walked over and handed me a small box and said something like "This is from your friends, to recognize a significant achievement". Inside was this precious object:



At least that's kind-of how I remember it; things went blurry for a few minutes. ***Thank You All*** - Tina KD7WSF, Michael KG7HQ and Shelly KC7NQC, Doug K7IP and Darci, Bill W7NWP and Marcela KD7RTC, Larry NM7A and Janet, and Curt WE7U and Teresia KD7YRA! I'm honored and humbled with this gift and recognition.

Welcome to all the new Zero Retries subscribers who learned of Zero Retries from a mention in [Amateur Radio Weekly](#). ARW is alerting me to a number of Zero Retries Interesting items.

This summer, there have been a few acquaintances that have made their way to the climate oasis that is the Northwest corner of Washington, specifically the bucolic San Juan Islands, and Vancouver / Victoria British Columbia. If you're passing through Western Washington, even as far South as Seattle, and would like to meet up and chat about Zero Retries Interesting subjects, just drop me a note. I also visit Portland, Oregon regularly to visit one of my favorite Amateur Radio Operators, Merideth KK7BK1. If you're a Zero Retries subscriber in Portland, I'd enjoy a meetup there also.

de Steve N8GNJ

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## M17 Project's New Project - Mini17



M17 Project TR-9 (Concept - *not* an actual radio) Image courtesy of M17 Project. This illustration is not necessarily indicative of the Mini17.

Things are moving fast on the M17 Project! M17 Project's Community Manager Ed Wilson N2XDD pointed me to the [Github page of the Mini17](#), which is only a few hours old as I type this.

Mini17 - QRP M17 handheld. Work in progress!

The schematic is just a sketch for now. Stay tuned. About The first handheld to support M17 was our own [TR-9](#). Unfortunately, the design has a minor flaw in the RF part and is very hard to assemble. After that, we tried modifying various radios with different outcomes. This is our new device - the Mini17. It's built around the [CC1200](#) RF chip, which does great job at receiving and transmitting M17 signals. The power output is limited to 16dBm (40mW), so it's a QRP radio. The idea is to build a small radio first and then add RF power amplifier stage later. A *Proof of Concept*, if you will. The design could even be extended to a mobile rig in the future.

The RF chip used is CC1200, MCU is STM32F427ZGT6. OLED display will probably be the same as in [Module17](#).

I *hope* that the Mini17 progresses to the point that they can be purchased and experimented with, such as the many [radio projects](#) that are launched on Crowd Supply.

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## DIY Low-Cost LoRa Satellite Ground Station



Image courtesy of Hackaday.io

*It still gobsmecks me that [LoRa](#), using very low power and Chirp Spread Spectrum (CSS) modulation, is sufficiently robust for real world usage as satellite (to ground) telemetry. Provably, it is, thus this project. This is about the easiest, least expensive entry point to participate in amateur (not quite Amateur Radio) space communications.*

*Note that articles on [Hackaday.com](#) are “news” articles. Articles on [Hackradio.io](#) are construction articles, and it’s typical that articles on [Hackaday.com](#) point to articles on [Hackaday.io](#) such as the case [here](#).*

I’ve previously expressed my admiration to [Hackaday.com](#) for treating projects involving radio technology as interesting projects that a techie with some basic electronics skills / experience can tackle, and this article exemplifies that.

Embedded engineer [Alberto Nunez] has put together [a compact LoRa satellite telemetry ground station](#) that fits in your hand and can be built for around \$40 USD.

The station receives signals from any of several satellites which use LoRa for telemetry, like the [FossaSat](#) series of [PocketQube](#) satellites. Even with a sub-optimal setup consisting of a magnetic mount antenna stuck outside a window, [Alberto] is able to receive telemetry from satellites over 2,000 kilometers distant. He also built a smaller variant which is battery powered for portable use.

## Ground station for LoRa satellites

The arrival of [small satellites](#) that used [LoRa](#) for telemetry data has meant that less technically qualified persons, with a very low budget, can receive their signals. Thanks to TinyGS, there is now an open network of distributed ground stations, and more stations can be built to increase their coverage. The project presented here is a reasonably robust, dust-resistant and waterproof implementation of TinyGS ground station, using commercial off-the-shelf components. Ideal for outdoor usage.

TinyGS is an open network of Ground Stations distributed around the world to receive and operate LoRa satellites, weather probes and other flying objects, using cheap and versatile modules.

This project is based on ESP32 boards and currently it is compatible with sx126x and sx127x LoRa modules but we plan to support more radio modules in the future.

Initially TinyGS was born under the name ESP32 Fossa Groundstation, it was developed as a “weekend” project for the FossaSAT-1 LoRa satellite. We are passionate about space and created this project to be able to track and use the satellites and to learn and experiment about radio. Currently the network is open to any LoRa satellite and we also support other flying objects that have a compatible radio modulation with our hardware such as FSK, GFSK, MSK, GMSK, LoRa and OOK. And the project was renamed to TinyGS.

This project really seems approachable, and amenable to improvements such as a better UHF antenna. Most of all, it looks like *fun!* And it’s *Space!*

Note that TinyGS is different from, but with a similar mission to [SatNOGS](#) - *Open Source global network of satellite ground-stations*.

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## The Amazing “Zero Retries Interesting” Issue of QST - May 1995

*See Request to Send in Zero Retries 0056 for context. Ideally, this would have run in that issue, but it was more urgent to finish a two-part series in that issue.*

The May 1995 issue of QST Magazine is perhaps the most amazing issue of QST that I can recall reading. If QST had maintained this level... *or even half this level...* of “Zero Retries Interesting” content... you wouldn’t be reading Zero Retries now. I’d just be a happy, reasonably informed reader of QST, and I’d be an enthusiastic supporter of ARRL, because the May 1995 QST included these **eleven (!) Zero Retries Interesting articles**:

- **A Red-Letter Day** (It Seems to Us, by David Sumner K1ZZ, Executive Vice President, Page 9). Explained the details of the allocation of the 219-220 MHz segment to US Amateur Radio. No yammering about mind-numbing adminstrivia internal to the ARRL's business operations. Rather, this was *useful, exciting information* that directly impacted the future of Amateur Radio!
- **Phase 3D: The Ultimate EasySat** (Article by Steve Ford WB8IMY, Assistant Managing Editor, Pages 21-23). This was a good overview of this new satellite for a general audience, potentially exposing those who might not have considered satellite operation.
- **"9600-Ready" Radio: Ready or Not?** (Article by Jon Bloom KE3Z, ARRL Senior Engineer, Pages 24-29). As *VHF/UHF FM transceiver manufacturers take the plunge and offer new radios that claim to be ready for 9600-baud packet operation with little or no modification, users are wondering if they really work. The ARRL Lab takes an objective look.*
- **APCO Project 25: Sweeping New Standards for Amateur Radio?** (Article by Kirk Kleinschmidt NT0Z, Pages 57-59). This is still relevant, as P25 is one of the four "Tower of Babel" Digital Voice Modes that Amateur Radio uses, that are non-interoperable.
- **Anatomy of a Repeater** (Article by Steve Ford WB8IMY, Pages 69-71.) Discussed the basics of repeater hardware.
- **Radio Tips: Amateur Satellite Frequencies and Modes** (Sidebar, uncredited author, Page 73).
- **Hooked on Meteors!** (Article by Tom Hammond KD8BMM, Pages 74 and 77). *Meteor scatter isn't just for the big stations.*
- **Azden PCS-9600D 440-MHz Voice/Data Transceiver** (Product Review, by Mark Wilson AA2Z, Editor, Pages 78-79).
- **Amateurs to Share 219-220-MHz Segment** (Happenings, by James Cain K1TN, Senior Editor, Page 93).
- **Packet Controller has GPS Firmware, Adapter** (New Products mention of the AEA PK-12 TNC, Page 107).
- **Super Packet Tricks** (Packet Perspective column by Stan Horzepa WA1LOU, page 109). (I like the phrase "Super Packet"). The lead mention was "Training the Watchdog, and other TCP/IP Tricks"... When's the last time you read about the use of TCP/IP in Amateur Radio (that wasn't referring to the Internet)?

May 1995 QST - *II* substantive articles or mentions of technological innovation Amateur Radio. August 2022 QST - *I* substantive article or mention of technological innovation in Amateur Radio.

Disclaimer - I agree in advance that in wanting to read articles about technological innovation / microwave / space / data communications... I've fallen out of the targeted demographic of the current-day ARRL and QST... but I believe I share that "out of the targeted demographic" with the vast majority of new Amateur Radio Operators under 60 years old.

Credit where credit is due - all of the above articles are still available via the [ARRL website](#) if you're an ARRL member - pull down year: 1995, pull down month: May), and downloadable as PDFs.

## ZR > BEACON

- **[Ten amateur radio CubeSats deployed from ISS](#)**  
My thanks to Steve Monsey N0FPF who was the first to alert me to this.  
*On July 21, 2022, during a spacewalk by Samantha Cristoforetti IZ0UDF and Oleg Artemyev, 10 amateur radio CubeSats were deployed from the International Space Station.*  
...  
*The SWSU series satellites were developed at the Research Institute of Space Instrumentation (part of Roscosmos) and radio-electronic systems of southwestern State University (SWSU).*  
...  
*The mission of the SWSU series satellites is to create a peer-to-peer information network. Within the network, retransmission and parallel transmission to the ground monitoring point are organized.*
  - *Study of the Earth's magnetic field.*
  - *Measurement of the noise of the radio broadcast in outer space.*
  - *Transmission of photos (SSTV) and voice messages (AUDIO) to radio amateurs around the world. For each satellite, a personal phrase will be selected, which is translated into 8 different languages.*
- **Recent updates in AREDN Nightly builds** - From AREDN Ambassador Orv Beach W6BI on the [Facebook AREDN Group](#):  
*The AREDN dev team is all about CI (Continuous Improvement). In that vein, recently nightly builds have these changes and improvements (plus other minor tweaks that the user won't see):*
  - *Manage tactical names better.*
  - *Fix random iperf failures.*
  - *Improve long filename display*
  - *Run an hourly check on published service and disable any which aren't really available.*
  - *As part of the work being done to cleanup published services on the mesh, now OLSR will forget services no longer provided by nodes. Rather than modify the publishing process, this code runs once per hour and will update the olsrd.conf file if it finds changes (a servicesdisappears, or a service reappears) and restart the daemon. Importantly, it doesn't remove any user configuration, so if a service is temporarily unavailable it will be re-published when it's online again.*
  - *Make Keep Settings more prominent; improve layout of Administration page.*

◦ Prevent < and > being used in service names.

- He's baaack! Bennet Z. Kobb AK4AV is out with another edition of his great newsletter - [Experimental Radio News 5](#).  
*In ERN 5 we've got drone killers, space tourists and a big flat satellite that makes phone calls - and two shortwave trading stations are denied license renewal.*  
Fascinating reading - ERN is, for me, a "read within hours" kind of publication. Kudos again AK4AV!
- If you've ever wondered what happened to the Amateur Radio Operator who rode around the US in the 1980s on a [computerized recumbent bicycle](#), Steven Roberts N4RVE is still around. He ditched the bike(s), settled down and bought property (it didn't take), got into boats, and settled in Friday Harbor (San Juan Islands), Washington. N4RVE was recently profiled in his new career - [Wizard with a Time Machine](#). While we haven't seen each in the COVID-19 era, I hope to visit with him again in August.

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## Updata

- In Zero Retries 0056, I said:  
*Mobilinkd offers a case and a [printed circuit board](#) for Nucleo TNC, but the problem is, of course, obtaining the components, most notably the Nucleo32-L432KC module that is the core of the Nucleo TNC.*  
Rob Riggs WX9O of Mobilinkd, and John Kreno N3XKD both wrote that the Nucleo32-L432KC module [is in stock at Mouser Electronics](#)!
- Regarding arranging FreeDV conversations (QSOs), John Hays K7VE and Alan Beard VK2ZIW mentioned <http://qso.freedv.org>.

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## Feedback Loop

**Derek Mullin VE3XEC** re: Zero Retries 0056 - *Nothing much to say except thanks for another issue. I'm always happy to see another edition of this newsletter on a Friday evening, and I always find something interesting inside.*  
Thank You for the note Derek!

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## Join the Fun on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out

**Join the Fun on Amateur Radio** for some pointers.

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## Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with wireless technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to anyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing *Thanks* to:

- Tina Stroh KD7WSF for, well, *everything*!
- Pseudostaffer [Dan Romanchik KB6NU](#) for continuing to spot, and write about "Zero Retries Interesting" items on his blog that I don't spot on my own.
- [Amateur Radio Weekly](#) and [Southgate Amateur Radio News](#) consistently surface "Zero Retries Interesting" stories.
- The [Substack email publishing platform](#) makes Zero Retries possible. I recommend it for publishing newsletters.

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More bits from Steve Stroh N8GNJ:

- [SuperPacket blog](#) - *Discussing new generations of Amateur Radio Data Communications - beyond Packet Radio (a precursor to Zero Retries)*
- [N8GNJ blog](#) - *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs - Bellingham, Washington, USA*

Thanks for reading!

Steve Stroh N8GNJ / WRPS598 (He / Him / His)

These bits were handcrafted in beautiful Bellingham, Washington, USA

2022-07-29

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